

Executive Summary

of

Manufacturing of Manganese Oxide & Ferro Alloys (By Thermite Process)

Proponent

M/s. Shree Pawan Metal & Minerals
Plot No. C-3 M.I.D.C. Area Deori, Tahsil-Deori, District- Gondia,
Maharashtra

By

Pollution & Ecology Control Services
NAGPUR

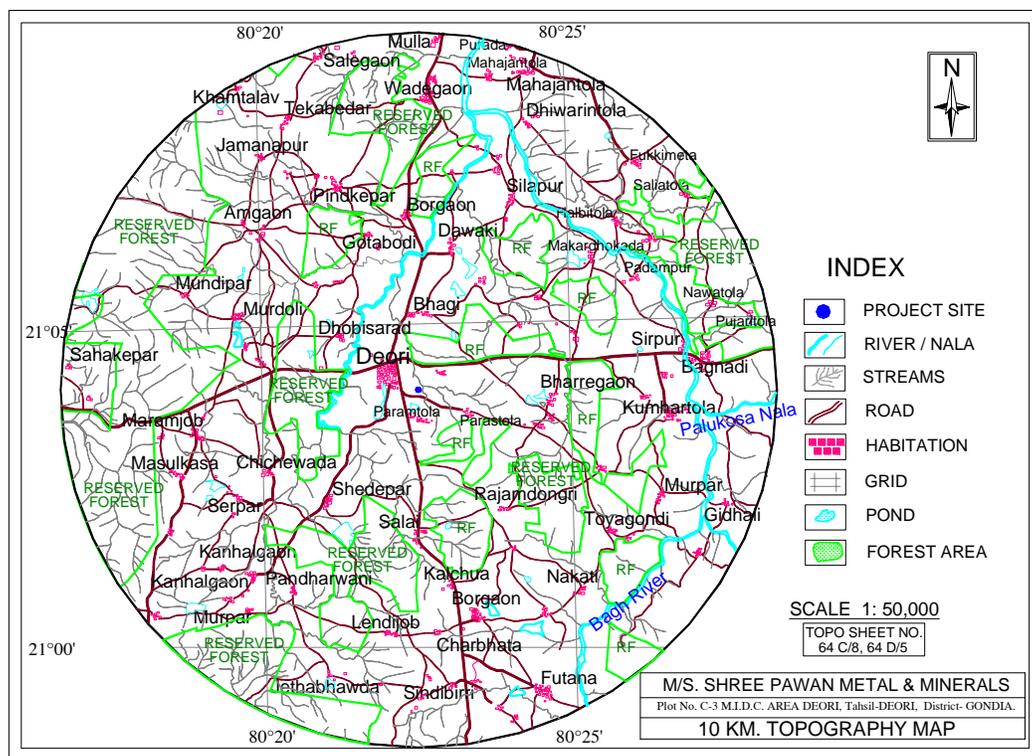
EXECUTIVE SUMMARY

1. Project Name and Location

M/s. Shree Pawan Metal & Minerals was established on 05/10/2012 whose Registered Office is at – Plot No. 8-A, Flat No. S-4 “Gokul Udhav Apartment” 2nd Floor, Mangalmurti chowk, Ring Road, Nagpur-440022 has been registered with the Registrar of Firm, Nagpur (M.S.) having Registration certificate No. NG000002712 dated 28th September 2016. The Set up unit is a small-scale industry, registered with District Industries Centre, having provisional registration No. DICN/Regn/1200 dated 06/10/2012.

The present and proposed manufacturing facility of the Company is situated over 0.54 Ha area, at Plot No. C-3 M.I.D.C. Area Deori, Tahsil-Deori, District- Gondia, Maharashtra. Coal shall be used as a reducing agent for Conversion of Manganese Ore to Manganese Oxide.

The topographical map is shown in the Figure below:



Source: SOI Toposheet

Topographical Map (10 km Radius)

2. Products and Capacities

The production scenario of the proposed plant is given below:

Proposed Products	Sr. No.	Product	Production
	1	Manganese Oxide powder	3600 MTPA
	2.	Ferro Manganese M.C./L.C OR	600 MTPA
	3.	Ferro Chrome L.C. OR	600 MTPA
	4.	Ferro Titanium OR	600 MTPA
	5.	Ferro Vanadium OR	600 MTPA
	6.	Ferro Molybdenum	120 MTPA
	7.	Aluminum Ingots	120 MTPA

3. Requirement of Land, raw material, water, power, with source of supply

Requirement of Land

The land required for the proposed project is 0.54 Ha (5402 Sq.m.).

Raw Material

The raw material requirement for the proposed unit is given below.

Raw Material Required For Manganese Oxide Production

Sr. No	Product	Raw Material Quantity	Source	Mode of Transport
1	Manganese Ore	4500 M.T. per annum	MOIL, Dongri Buzurg	Trucks
2.	Steam coal/Hard coke	450 T. per annum	WCL, Umred	Trucks

Raw Material Required For Ferro Alloys Production (By Thermite Process)

Sr. No	Product	Raw Material Quantity	Source	Mode of Transport
1.	Ferro Manganese M.C./L.C (For 600 M.T. per annum Production)			
	Manganese powder	660 M.T. per annum	Local	Trucks
	Silico Manganese powder	465 M.T. per annum	Market	
	Aluminum powder	120 M.T. per annum		
	Lime/Fluorspar	130 M.T. per annum		
2.	Ferro Chrome L.C. (For 600 M.T. per annum Production)			
	Chrome Ore	1200 M.T. per annum	Local	Trucks
	Sodium Nitrate	95 M.T. per annum	Market	
	Aluminum	480 M.T. per annum		
	Iron Ore	120 M.T. per annum		
	Lime	95 M.T. per annum		
3.	Ferro Titanium L.C. (For 600 M.T. per annum Production)			
	Ilemenite	1080 M.T. per annum	Local	Trucks
	Routile	120 M.T. per annum	Market	
	Aluminum powder	480 M.T. per annum		
	Lime	95 M.T. per annum		
	Iron Ore	120 M.T. per annum		
4.	Ferro Vanadium L.C. (For 600 M.T. per annum Production)			
	Vanadium Pent oxide	1200 M.T. per annum	Local	Trucks
	Ferro Silicon	540 M.T. per annum	Market	
	Aluminum scrap	60 M.T. per annum		
	Iron Scrap	60 M.T. per annum		
	Fluorspar	20 M.T. per annum		

5.	Ferro Molybdenum (For 120 M.T. per annum Production)			
	Moybdenum Concentrate	113 M.T. per annum	Local Market	Trucks
	Aluminium Powder	10 M.T. per annum		
	Lime Powder	11 M.T. per annum		
	Iron Scrap	143 M.T. per annum		
	Ferro Silicon	32 M.T. per annum		
6.	Aluminum Ingots/shots/notch Bar (For 120 M.T. per annum Production)			
	Aluminum Scrap	144 M.T. per annum	Local Market	Trucks

Water Requirement

Water requirement for the project will be about 12 KLD for the process and it will be provided by MIDC. .

Mainly the water shall be required for Zigging Process as well as for Pollution control device, drinking and Plantation.

Power Requirement

The power required will be supplied by State Electricity Board. The power requirement for the proposed project will be 120 kW.

4. Process Description

Manufacturing Process of Manganese Oxide

- (A) After Raw Material receipt at the site it is tested for the contents of various elements and then the material is screened. After screening manual zigging is carried out.
- (B) The material is then heated in coal fired furnace. From where it is transferred for drying and magnetic separation.
- (C) Then the material is dried and after Magnetic Separation it is feed to grinding Machine, where it is powdered in the required mesh size.

(D) After grinding it is semi automatically packed in 25 kg/50 kg/ or 100 kg HDPE Bags and kept ready for dispatch.

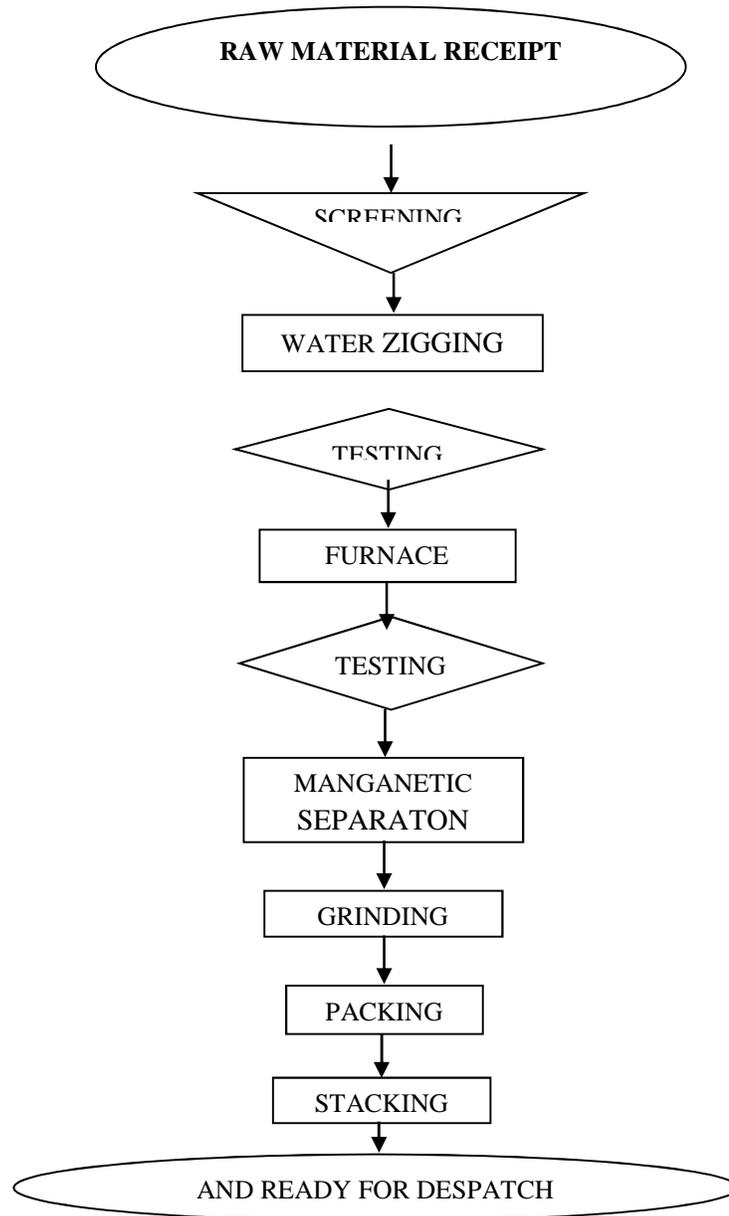


Figure : Process Flow Chart of MnO Production

Ferro Alloys / And Other Noble Ferro Alloys Thermite Process

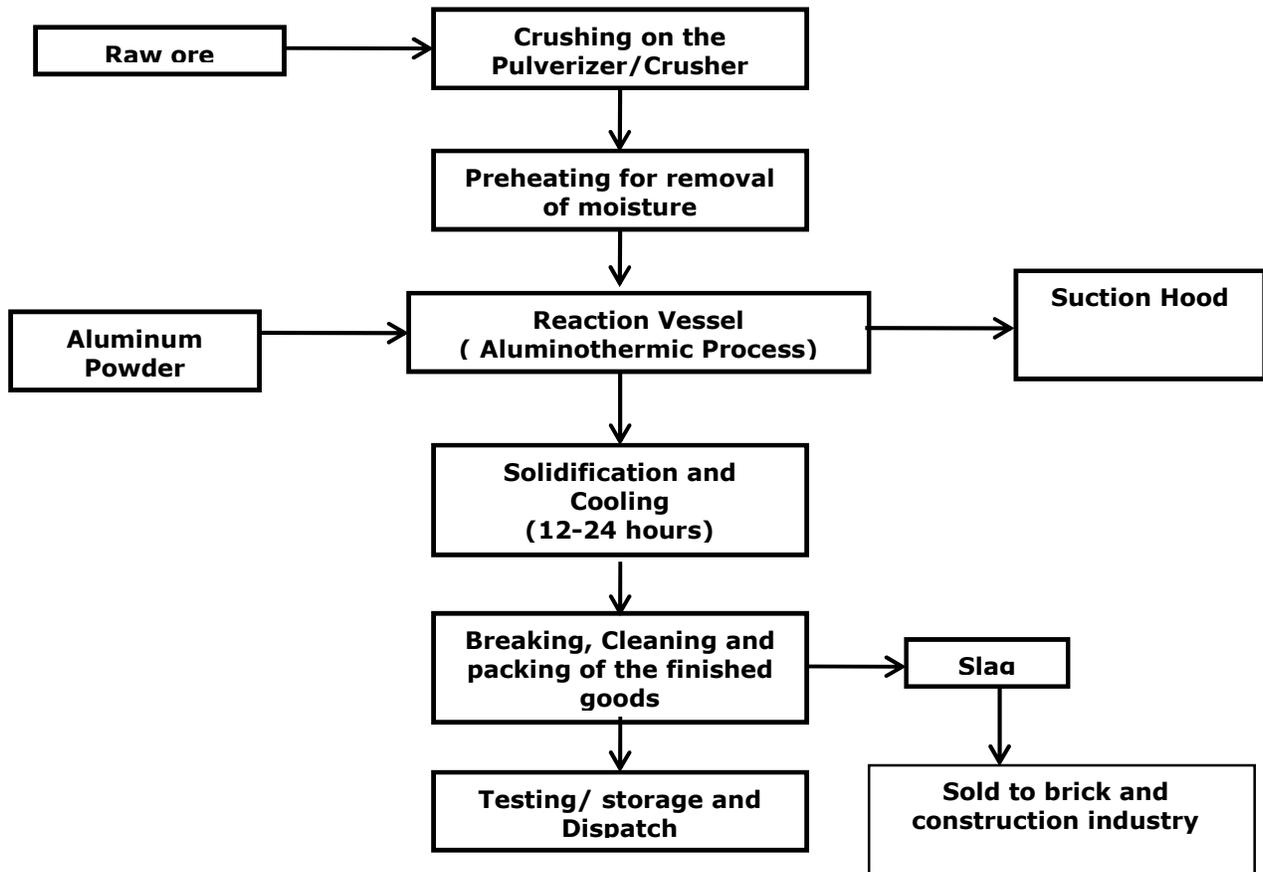
Manufacturing of Ferro Alloys through Termite Process is very easy and simple.

Following activities are carried on:

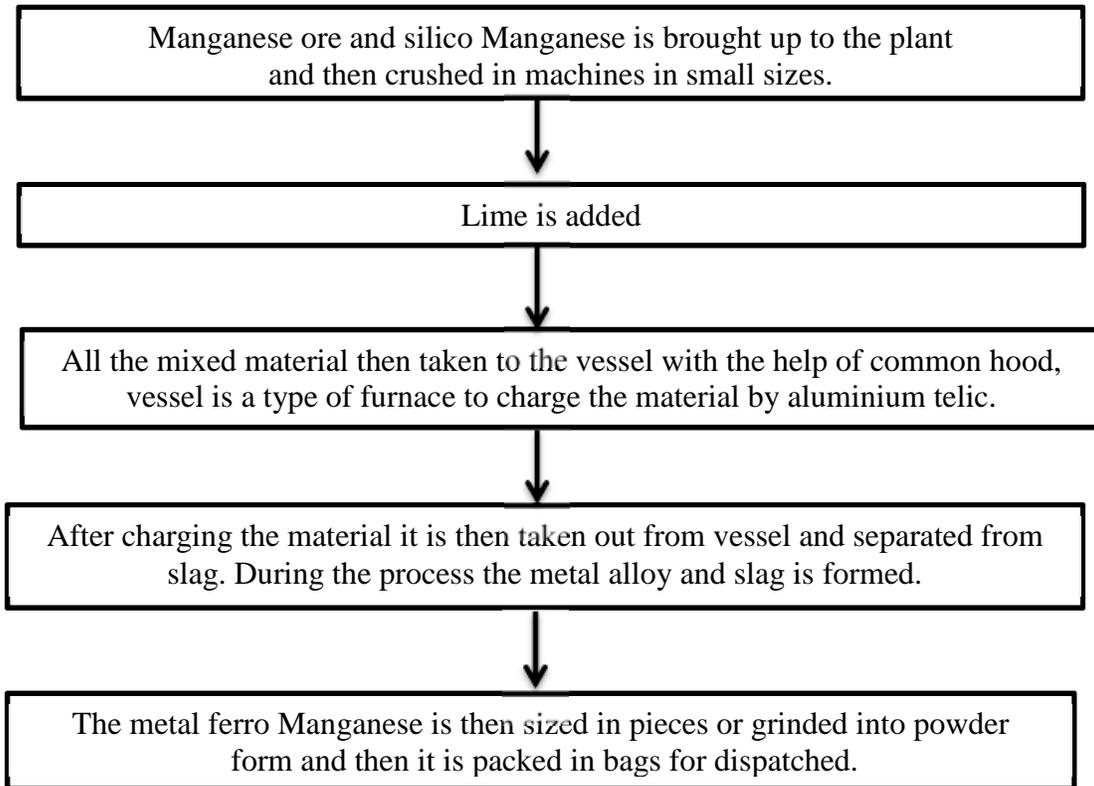
- (a) Powdering of different Alloys / Minerals.
- (b) Mixing in blender in the required proposition

- (c) Then a small fire is created (By aluminum powder) in the reaction vessel, where this blended material is added slowly. The powder starts melting inside the vessel and the Metallic contents are automatically separated which settles down and the sludge floats.
- (d) Metal and Sludge are separated by manual processes.
- (e) Metal is crushed and for some customer it is powdered in Pulveriser.
- (f) The Metal is crushed and packed in bags and kept ready for dispatches.

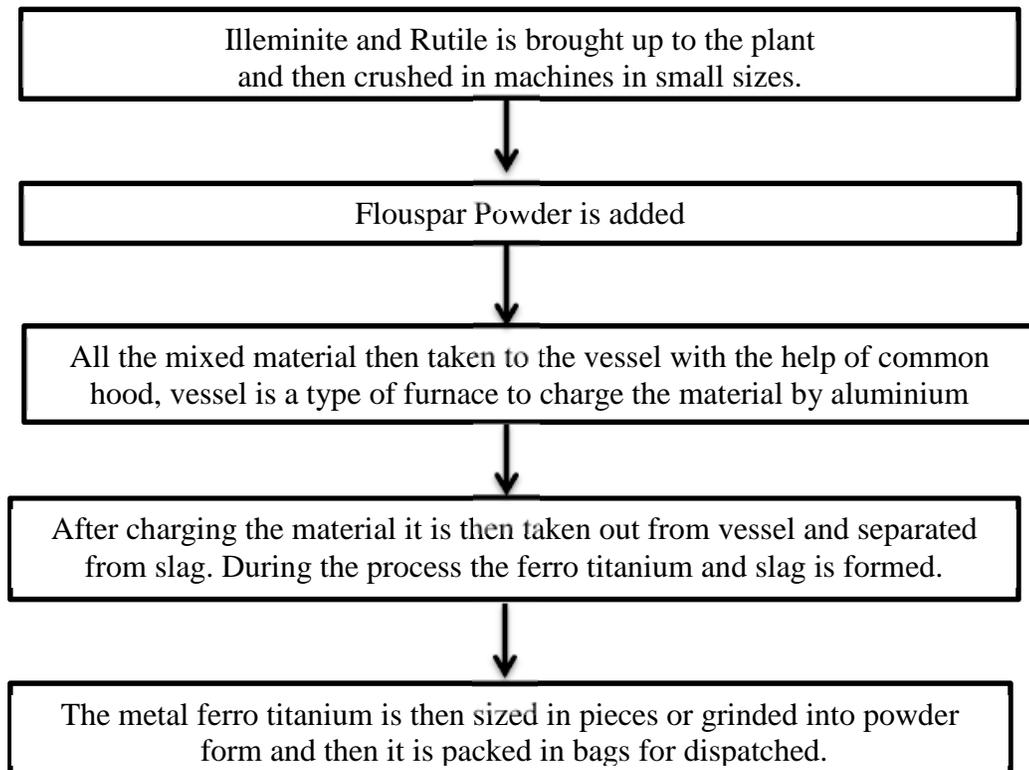
PROCESS FLOW CHART



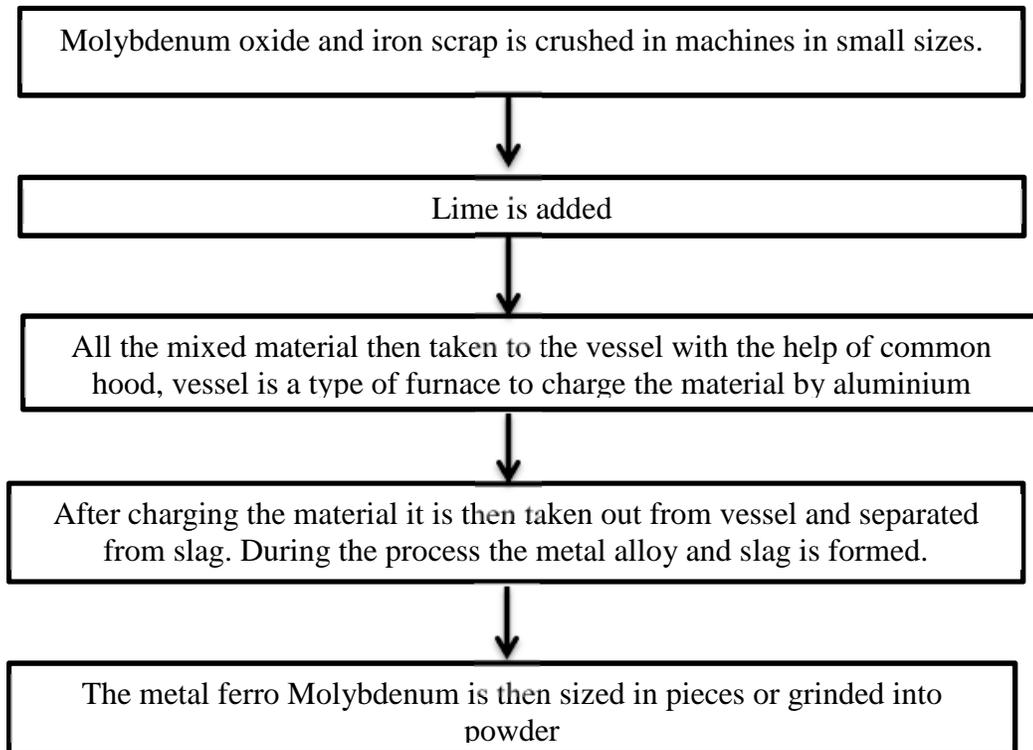
FLOW CHART FOR MEDIUM/LOW CARBON FERRO MANGANESE



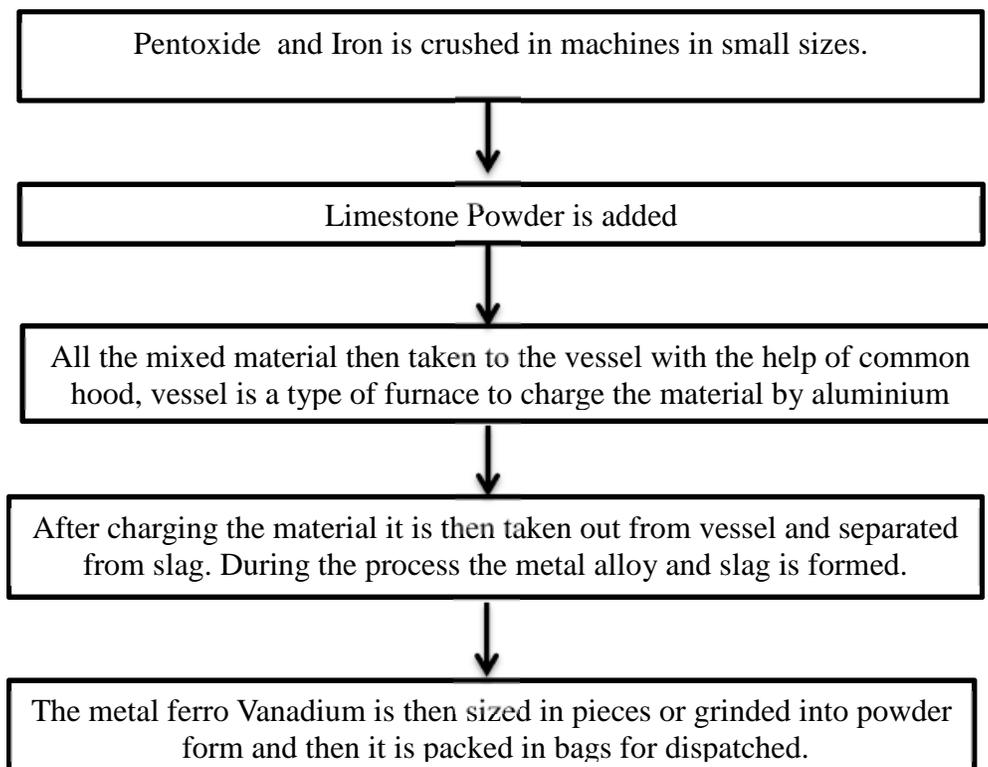
FLOW CHART FOR FERRO TITANIUM



FLOW CHART FOR FERRO MOLLYBDENUM



FLOW CHART FOR FERRO VANADIUM



5. Mitigation Measures

The present baseline concentrations were monitored in the EIA study. The additional emissions are mainly from furnace during roasting of manganese ore with coal, grinding of Manganese Ore and during thermite process in the reaction vessel.

The proposed project activity will result in air emissions from the following areas.

a) Raw material Handling and storage area

b) Furnace (MnO)

c) Reaction Vessels (Ferro Alloys)

c) Transportation

- M/s. Shree Pawan Metal and Minerals shall provide dust suction system which will control fugitive emission due to material and raw material handling.
- Regular monitoring of air quality parameters.
- A common Stack of 30 mt ht will be attached to both reaction vessel (Ferro Alloys) and furnace (MnO) with wet scrubbers to minimize the concentration of pollutants which is mainly PM₁₀, PM_{2.5}.
- The vehicles transporting raw materials will be covered with tarpaulin in order to prevent dust emission during the transport.
- It would be ensured that all the vehicles in the working zone are properly maintained to keep emissions within the permissible limits.
- At loading and unloading points, arrangement for Water sprinkling will be made so that dust generation during transportation of materials will be minimized further.
- The finished product will be transported by the same trucks carrying raw material.
- Plantation in the plant premises will be done in the 33% of the total land.
- All the internal roads shall be concreted / asphalted to reduce the fugitive dust due to vehicular movement
- Water spraying will be practiced frequently
- Whenever, APCS is not working, then raw material feed will be stopped. Consequently there will be no production in the unit till APCS is rectified.

Prediction of Air quality

The mathematical model used for predictions on air quality impact in the present study area is ISC-AERMOD View. It is the next generation air dispersion model, which

incorporates planetary boundary layer concepts. These models are used extensively to assess pollution concentration and deposition from a wide variety of sources. The predicted values in respect to PM₁₀, SO_x and NO_x were found to be below the Ambient Air Quality Standard of CPCB.

Noise Pollution & control measures

In plant, workers particularly working near higher noise sources, may be exposed to higher level upto 75 dB(A) for longer durations. However, provision of ear plugs or ear muffs shall be made for in-plant workers working at such locations.

The employees shall be trained in the mitigation measures and personal protection measures to be taken to prevent noise related health impacts.

Impact on Water

The total water requirement for the proposed activities is 12 KLD. During plant operation waste water will be generated from the zigging process. The wastewater generated in this process will be treated in the settling tank and will be reused in the process. The sewage generation will be 1.6 m³/day in the proposed facilities which will be treated in Packaged Type STP. No major river within 1 km of the study area.

Solid Waste Generation

The solid waste generation in the proposed plant is given in table below

Table: Solid Waste Generation & Mitigation Measures

Waste	Quantity	Mitigation Measures
Slag	500 TPA	Solid waste is nonhazardous and non-toxic in nature. Slag will be sold to brick and construction industry.
Ash	45 TPA	Will be sold to brick manufacturers

Green belt

Green belt will be developed within the Plant premises covering a total area of about 1783 sq mt (33%) of total Plant area and 285 no. of trees will be planted. The plantation work for green belt development will be carried out. Local species would be preferred.

6. Capital Cost

Total Project cost for proposed project is Rs. 2.16 Crores.

7. Baseline Environmental Data

Air Environment

The baseline environmental quality for the February, March, April, May 2019 was assessed in an area of 10 km radius around the proposed project site. The ambient air quality monitored at 8 locations selected based on predominant wind direction, indicated the following ranges;

PM ₁₀	-	31.5 µg/m ³	-	63.8 µg/m ³
PM _{2.5}	-	15.2 µg/m ³	-	32.6 µg/m ³
SO ₂	-	8.1 µg/m ³	-	22.5 µg/m ³
NO _x	-	9.8 µg/m ³	-	29.5 µg/m ³

The concentrations of PM₁₀, PM_{2.5}, SO₂ and NO_x were found within the National Ambient Air Quality Standards (NAAQ).

Water Environment

A total 16 samples including eight surface & eight ground water samples were collected and analyzed. The water samples were analyzed as per Standard Methods for Analysis of Water and Wastewater, American Public Health Association (APHA) Publication.

The data indicates that the ground water as well as the surface water quality are below the stipulated standard for drinking water (IS 10500 – 1993).

Noise Environment

Noise levels measured at eight stations were within limit of 55.0 dB (A) for Residential Area or 75.0 dB (A) for Industrial Area as given in MoEF Gazette notification for National Ambient Noise Level Standard.

Land Environment

The characteristics of the soil sample were compared with different depths for respective parameters in four stations.

The observations of soil characteristics are discussed parameter wise below;

8. Texture of soil samples from agriculture land and waste land are silty loam and sample from Forest land are clay-loam in Texture Classification.

- (b) Colour of soil samples from agriculture and forest lands are gray and sample from waste land are Yellowish in colour.
- (c) The bulk density of soil samples from Forest land are in the range of 1.63 to 1.70 g/cc and sample from agriculture land are in the range of 1.69 to 1.73 g/cc and sample from waste land are in the range of 1.62 to 1.65 g/cc.
- (d) Soil samples from Forest land have pH values between 7.1 to 7.4 and sample from agriculture land have 8.4 to 8.5 and sample from waste land have 7.9 to 8.1 ranges of pH values. The pH values are indicating nature of soil samples is neutral to alkaline.
- (e) Soil samples from Forest land have conductivities between 0.119 to 0.124 mmhos/cm and conductivities of soil sample from agriculture land ranges between 0.126 to 0.143 mmhos/cm and conductivities of soil sample from waste land ranges between 0.089 to 1.04 mmhos/cm.
- (f) Soil samples from Forest land have Organic Matter between 8.94 to 10.22 % and sample from agriculture land have between 2.06 to 3.34 % Organic Matter and sample from waste land have between 0.89 to 1.33. These values represent good fertility of soils.
- (g) Soil samples from Forest land have concentration of Available Nitrogen values ranged between 156.88 to 356.55kg/ha and samples from agriculture land range between 250.9 to 301.33 kg/ha and samples from waste land range between 116.61 to 136.90 kg/ha Available Nitrogen value.
- (h) Soil sample from Forest land have concentration of Available Phosphorous values ranged between 46.67 to 76.44 kg/ha and soil samples from agriculture land have concentration values ranges from 25.98 to 29.88 kg/ha and samples from waste land have concentration values ranges from 19.26 to 25.55 kg/ha.
- (i) Soil sample from Forest land have concentration of Available Potassium values range between 130 to 164.80 kg/ha and sample from agriculture land concentration of Available Potassium as its values range between 187.3 to 278.49 kg/ha and sample from waste land have values range between 185.5 to 194.6 kg/ha. Characteristic of Waste land soil is a little deficient in nutrients concentration. Whereas, forest & agricultural land soils are moderately suitable for cultivation of climatic crops and have good fertility.

9. Impact of the Project

The impacts of the projects are tabulated below:-

Impact on Air Quality

The emissions are mainly from furnaces during roasting of manganese ore with coal and grinding of Manganese Ore.

The proposed project activity will result in air emissions from the following areas.

- a) Raw material Handling and storage area
- b) Furnace
- c) Reaction Vessels
- d) Transportation

Noise Levels

During operational phase in the proposed project the major noise generating source is plant machinery. Under any circumstances the noise level from each of these sources will not exceed 75 dB (A). Noise levels generated in the project site will be confined within the Proposed plant the impact of noise levels on surrounding will be insignificant.

Impact on Water

The total water requirement for the proposed activities is 12 KLD. During plant operation waste water will be generated from the zigging process. The wastewater generated in this process will be treated in the settling tank and will be reused in the process. The sewage generation will be 1.6 m³/day in the proposed facilities which will be treated in Packaged Type STP.

Impact on soil

According to the Notification S.O. 612(E) dated 25th February 2016 Distance from Eco-Sensitive Zone around Nagzira Wildlife Sanctuary, New Nagzira Wildlife Sanctuary, Koka Wildlife Sanctuary, Navegaon Wildlife Sanctuary and Navegaon National Park: 0.2 km. The impact on terrestrial ecology will be negligible in the first instance and shall be insignificant.

10. Environment Monitoring Programme

The environmental monitoring is important to assess performance of pollution control equipment installed in the proposed project of M/s. Shree Pawan Metal & Minerals. The proposed project is for a manufacturing of Manganese oxide & Ferro Alloys (By Thermite Process). The sampling and analysis of environmental attributes including monitoring locations will be as per the guidelines of the Central Pollution Control Board. Environmental monitoring will be conducted on regular basis by M/s. Shree Pawan Metal & Minerals through MoEF&CC Recognized Laboratory to assess the pollution level in the proposed plant. Therefore, regular monitoring program of the environmental parameters is essential to take into account the environmental pollutant of the study area. The objective of monitoring is:

- To verify the result of the impact assessment study in particular with regards to new developments;
- To follow the trend of parameters which have been identified as pollutants;
- To check or assess the efficiency of the controlling measures;
- To ensure that new parameters, other than those identified in the impact assessment study, do not become critical due to the commissioning of proposed facilities;
- To check assumptions made with regard to the development and to detect deviations in order to initiate necessary measures;

The attributes, which needs regular monitoring, are specified below:

- Air quality
- Water and wastewater quality;
- Noise levels;
- Soil quality;

11. CER

As per the Notification dated 1.05.2018 issued by MOEF&CC, it is mandatory to prepare Corporate Environment Responsibility Plan (CER) to spend 2 % (project cost \leq 100 crores) of total capital cost of the project on social, economical and peripheral development activities. As per the above mentioned new office memorandum CER dated

1.05.2018. Rs. 4.32 lacs have been allocated for CER based on public hearing issues and requirement of the local people.

12. Occupational Health Measures

M/s. Shree Pawan Metal & Minerals will provide all necessary provisions under Factory Act. All personal protect equipments like Safety shoes, helmet & uniform will be issued to each employee based on the nature of job involved. Details given in the EIA report.